

# Intelligent Suitcase System

## 1. Element of the project:

There are 4 elements being implemented into our intelligent suitcase system:

1. Suitcase (figure 1)
2. Handhold controller (figure 2)
3. User's computer
4. Airport mini tracking system (with Xbee and camera)

Xbee: a RF signal transmission and receiving device. (Figure 3)



Figure 1(Suitcase)

Figure 2(Handhold controller)

Figure 3(Xbee)

## 2. Design motivation and corresponding features introduction:

Our intelligent suitcase is designed based on working smartly in three practical scenarios:

1. Before Departure: In the scenario when user want to prepare for the departure, we consider some of the typical problems, users will encounter and the corresponding feature is as below:
  - (a). Our suitcase has a function of automatically weighting, which help the user be aware of the weight of his luggage to avoid overweighting.
  - (b). Users sometimes may forget about their travel information, to their convenience, our handhold controller allows user to download information from their own PC, and such information can also be synchronized to the suitcase, in case when user forget them.
2. At the airport: Our focus on this part is how to ensure the security of the suitcase in an efficient way. Our assumption is the suitcase will be locked after the user reaches the airport. In this lock mode we implement the following features:
  - (a). If we want to open the suitcase, there are two method to apply. One is RFID authorization and the other is remote keypad coding unlock. Both of two approaches are written in the interrupt, so the suitcase makes quickly respond to the two types of authority signals.
  - (b). A higher security mode allows the suitcase to check the vibration (vibration sensor) on itself. Suitcase and handhold will alert together to reminder the user about the abnormal movement.
3. After losing the suitcase, we came up with two ways to help the user to find this suitcase.
  - (a). The airport tracking and localization system: making use of camera to find the location of user's suitcase by detecting the 2D Bar code on the surface of each suitcase(including others'). If the user's ID is detected, user can request the airport computer center to send back a detail location of his suitcase.
  - (b). If the camera still cannot detect the missing suitcase, using handhold send signal to the suitcase compelling it reveal the user's information on the LCD of the suitcase is the second method. It is more convenient for others to return the suitcase whenever they see the information on the LCD

### 3. The advantage of our project:

There are 4 main advantages of our project: completed flow, user-friendly design, smart communication function, high practicability. Our design is based on the whole flow that a person packages his luggage, goes to the airport, and tries to find his missing suitcase. We have considered as many possible scenarios as we can. Meanwhile we try to make the whole project user-friendly and intelligent, so we make many of the process into an automatic manner, and also implement the communication system into our project, which is completed intelligent and stable. The core value we add here is the success of three-way communication imitating the idea of broadcasting. The whole communication diagram is shown as figure 4. Furthermore, all the features and functions our project provides are relatively practicable form self-weight to security system. They make the travel more convenient and relieved.

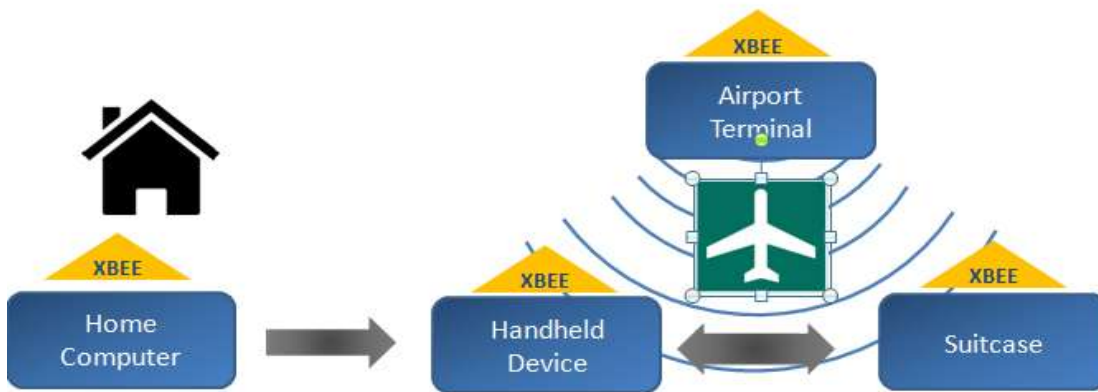


Figure 4

### 4. Future work:

The intelligent suitcase system is actually a multiple complex system, so the future improvement should be done in all of the individual part. For the handheld controller we can try to combine it into our hand phone; for the suitcase maybe a self-following function is another task; for the airport computer center, actually in practice we can image a CCTV system can take the role of our single camera.